The Drive & Control Company

Rexroth
Bosch Group

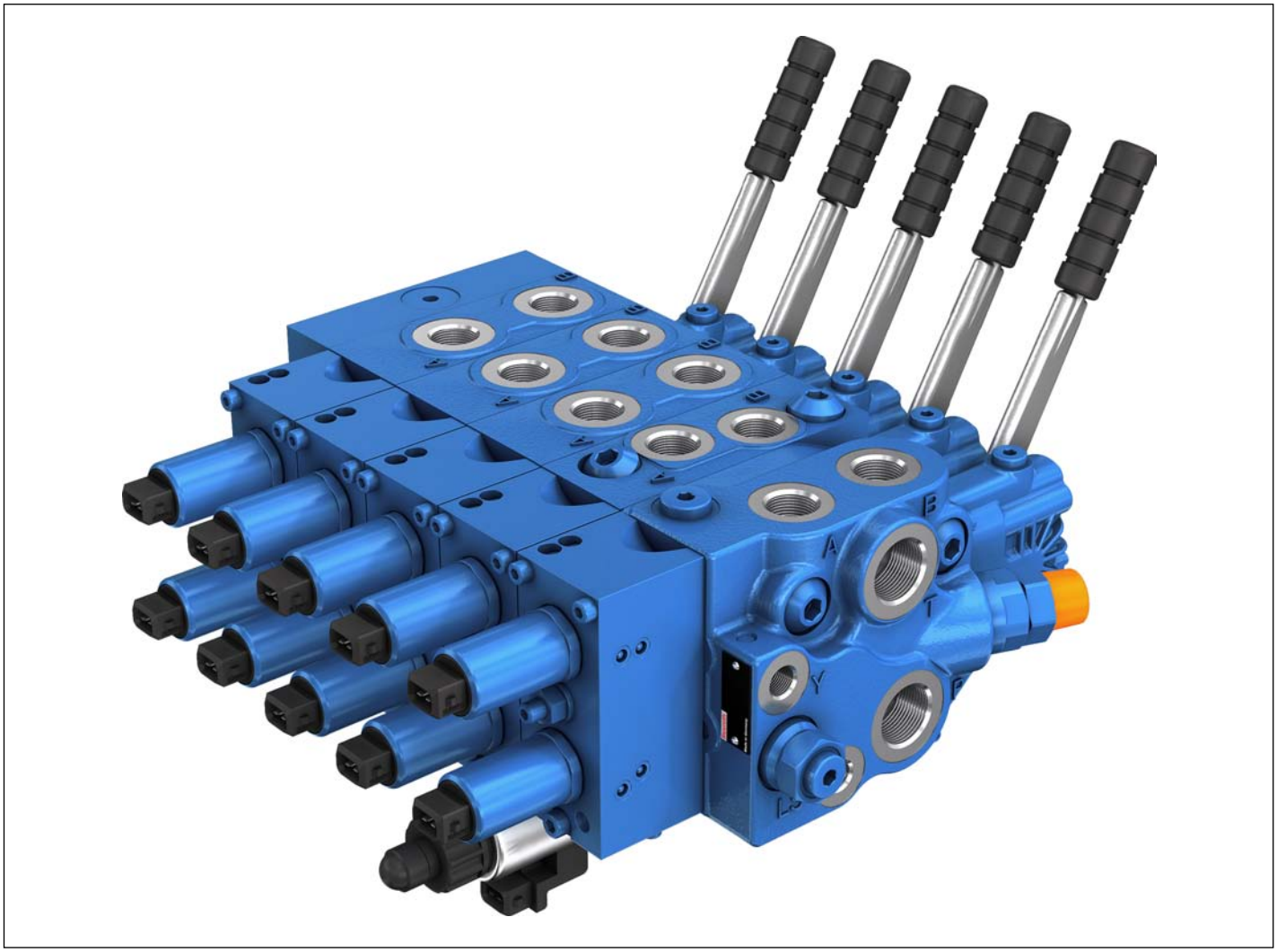
Load sensing control block M4-12

Basic document

01-R

Repair manual
RE 64276-01-R/10.2017

Replaces: 10.2014
English



An example configuration is shown on the title page. The product delivered may therefore differ from that shown.

The original repair manual was created in the German language.

Contents

1 About this manual

This repair manual is made up of the following parts:

Part 01	**Basic document**
Part 10	Control block assembly
Part 20	Repairing the directional valve
Part 30	Repairing the electro-proportional pressure relief system
Part 40	Repairing the electronics (EPM2)
Part 41	Repairing the electronics (CPM)
Part 50	Repairing the inlet plate
Part 51	Repairing the inlet plate for safety-related applications

1.1 Validity of the documentation

This documentation applies to the following products:

- Load sensing control block M4-12

This manual is aimed at vehicle manufacturers, assemblers and service technicians, as well as authorized specialist companies and dealers.
This documentation contains important information on the safe and proper repair of the control block.

- Read this documentation in its entirety and in particular the sections 2 “Safety instructions” page 7 and 3 “General notes on damage to equipment and the product” on page 12 before working with the product.

1.2 Required and supplementary documentation

- Only commission the product if the documentation marked with the book symbol 🕮 is available to you and you have understood and observed it.

Table 1: Required and supplementary documentation

	Title	Document number	Document type
🕮	**Control blocks for mobile applications** Contains important information for safely and professionally transporting, installing, commissioning, servicing and removing the Load sensing control block M4-12.	64025-B	Operating instructions
🕮	**Load sensing control block M4-12 for safety-related applications** Contains important information for safely and professionally transporting, installing, commissioning, servicing and removing the Load sensing control block M4-12 for safety-related applications.	64276-01-B	Operating instructions
🕮	**Load sensing control block M4-12** Contains the permissible technical data.	64276	Data sheet
🕮	**Load sensing control block M4-12** Contains the spare parts available to order.	64276-E	Spare parts list

Related documents for the assembly and repair can be found in Table 21 on page 25 and can be obtained where necessary via
www.boschrexroth.com/mobile-hydraulics-catalog
Documents relating to the general circuit diagram of the machine are available from the vehicle manufacturer.

1.3 Display of information

Standardized safety instructions, symbols, terms and abbreviations are used throughout this documentation so that you can work quickly and safely with your product. To give you a better understanding, these are explained in the sections below.

1.3.1 Safety instructions

This manual includes safety instructions in the sections 2.3 “Product-specific safety instructions” on page 8 and 3 “General notes on damage to equipment and the product” on page 12 , as well as prior to sequences of actions or instructions where there is a risk of injury or material damage. The measures described to avert danger must be observed.

Safety instructions are set out as follows:

⚠ SIGNAL WORD

Type and source of danger
Consequences of non-compliance
▶ Measures to avert danger

- **Warning sign:** draws attention to the danger
- **Signal word:** identifies the degree of danger
- **Type and source of the hazard:** identifies the type and source of the danger
- **Consequences:** describes what will happen if the safety instructions are not complied with
- **Precautions:** states how the danger can be avoided

Table 2: Hazard classes as defined in ANSI Z535.6

Warning sign, signal word	Meaning
⚠ DANGER	Identifies a dangerous situation that will result in death or serious injuries if it is not avoided.
⚠ WARNING	Identifies a dangerous situation that may result in death or serious injuries if it is not avoided.
⚠ CAUTION	Identifies a dangerous situation that may result in minor to moderate injuries if it is not avoided.
NOTE	Property damage: The product or the environment may be damaged.

1.3.2 Symbols

The following symbols indicate information that is not directly relevant to safety but increases understanding of the manual.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is disregarded, the product cannot be used or operated to its optimum potential.
▶	Single, independent step
1. 2. 3.	Numbered instruction: The numbers indicate that the steps must be completed one after the other.
❶	Black circle with white number: Markings for better understanding.
①	White circle with black number: Item or assembly with a reference to the parts list and to the graphics within a section.
Ⓐ	White circle with black letters: Assembly with reference to the parts list and the graphics within a section.
Ⓘ	White circle with black Roman numeral: Variants Views

1.3.3 Designations

This documentation uses the following designations:

Table 4: Designations

Designation	Meaning
M4-12	Directional valve
KBPS	Proportional pressure relief

1.3.4 Abbreviations

This manual uses the following abbreviations:

Table 5: Abbreviations

Abbreviation	Meaning
IP	Inlet **P**late
PRV	**P**ressure **R**elief **V**alve
EP	**E**nd **P**late
IPC	**I**ndividual **P**ressure **C**ompensator
FDP	**Fix**ed Displacement **P**ump
LS	**L**oad **S**ensing
SOV	**Sho**rt-O**ff** Valve
VP	**V**ariable **P**ump

2 Safety instructions

2.1 About this section

Before working on the product, read the appropriate instruction manual thoroughly and completely. If necessary, request the manual from Rexroth.

2.2 Personnel qualifications

This repair manual is aimed at skilled personnel with specialist knowledge in hydraulics who have taken part in a service training course at Rexroth.
Skilled personnel are individuals who:

- Have acquired sufficient knowledge through professional training and experience
- Are able to evaluate the work assigned to them
- Can identify potential dangers
- Can implement the measures required in order to eliminate dangers
- Are aware of the potential health risks posed by hydraulic fluids
- Have the necessary knowledge to carry out repair and assembly work

Specialist knowledge of hydraulics means:

- Reading and fully understanding hydraulic diagrams
- Specifically, fully understanding the relationships with regard to the installed safety devices
- Understanding how hydraulic components work and are put together

Bosch Rexroth offers training support for specialist fields. An overview of the training contents can be found on the Internet at:
http://www.boschrexroth.com/training.

2.3 Product-specific safety instructions

The following safety instructions apply to section 5 to 7.

⚠ WARNING

Danger from suspended loads!

Risk of death or injury, or property damage.

Improper transportation may cause the control block to fall down and result in injury, e.g. crushing or fractures, or damage to the product.

- Make sure that the lifting capacity of the lifting device is sufficient to safely bear the weight of the control block.
- Never stand or put your hands under a suspended load.
- Make sure the unit remains stable during transport.
- Wear your personal protective equipment (e.g., safety goggles, safety gloves, suitable working clothes, safety shoes).
- Use suitable lifting devices for transportation.
- Observe the prescribed position of the lifting strap.
- Observe the national laws and regulations on work and health protection and transportation.

Machine under pressure!

Danger to life or risk of injury, serious injuries when working on machines not shut down! Risk of property damage.

- Turn off the entire system and secure it against being restarted as specified by the machine manufacturer.
- Make sure that all relevant components of the hydraulic system are depressurized. Please follow the machine manufacturer's instructions.
- Note that the hydraulic system may still may be under pressure even after the pressure supply itself has been disconnected.
- Do not disconnect any line connections, ports and components while the control block is under pressure.

Escaping oil mist!

Risk of explosion and fire, health hazard, risk of environmental pollution.

- Depressurize all relevant components of the hydraulic system and repair the leak.
- Only perform welding work when the machine is depressurized.
- Keep open flames and ignition sources away from the control block.
- If control blocks are located in the vicinity of ignition sources or powerful thermal radiators, a shield must be erected to ensure that any escaped hydraulic fluid cannot be ignited, and to protect hose lines from premature aging.

Electrical voltage!

Risk of death or injury from electric shock or risk of property damage!

- Always set up the relevant part of the machine so that it is deenergized before you install the product or when connecting and disconnecting connectors.
- Secure the machine against being re-energized.

⚠ WARNING

Restriction of the control function!
Risk of death or injury, or property damage.
Moving parts in control and regulation systems (e.g. control spools) may in certain circumstances become stuck in an undefined position due to contamination (e.g. contaminated hydraulic fluid, abrasion or residual dirt from components). The volume flow of the driven consumer will then no longer follow the commands of the operator.

- Secure the machine against rolling away and unintentional movements according to the specifications of the machine manufacturer.
- Observe the specified cleanliness level of the hydraulic fluid in accordance with a data sheet.

Risk of pressurized hydraulic fluid leaking or fly-away parts!
Danger to life or risk of injury. If fasteners without sufficient high pressure resistance are used, they can cause rupturing and leakage of hydraulic fluid and/or fly-away parts. The ports and fastening threads of the control block are designed for the specified maximum pressure.

- Only ever connect connecting elements and lines that match the ports of the control block and can resist the intended application conditions (e.g. pressure level, flow, hydraulic fluid, temperature) with the necessary safety factors.

Faulty power supply!
Danger to life or risk of injury due to uncontrolled valve settings! These settings can lead to unexpected behavior of the control block.

- Always connect the ground connection of the control block to the corresponding ground system in your installation.
- Only ever use a power supply unit with safe separation. Always take into account your country-specific specifications.

⚠ CAUTION

Risk of injury from sharp edges and rough surfaces!
Risk of injury when working with and transporting the control block, e.g. due to sharp edges on the valve housing, on threads or attachments.
- Wear safety shoes with steel toecaps.
- Wear safety gloves and appropriate working clothes to protect against injuries.

Crushing and impact hazard for limbs!
In the gap between the actuation element and the valve housing, you can injure yourself.
- Do not put any parts of your body in the gap between the actuation element/hand lever and the valve housing.

High noise levels during operation!
Risk of hearing damage or hearing loss!
The noise emission of control blocks depends, among other factors, on the working pressure and the installation conditions. The sound pressure level may rise above 70 dBA under certain application conditions.
- Always wear hearing protection when you are in the vicinity of the running control block.

Hot surfaces on the control block!
Risk of burns.
- Allow the control block to cool down sufficiently before touching it.
- Wear heat-resistant protective clothing, e.g., gloves.

Cold surfaces on the control block!
Sticking skin, frostbite by touching the cold valve housing!
- Wear personal protective clothing, e.g. cold-resistant gloves.

Improper routing of cables and lines!
Risk of stumbling and property damage. Improper routing of cables and lines can cause a risk of stumbling as well as damage to equipment and components, e.g., lines and connectors tearing.
- Always route cables and lines in such a way that no one can trip over them, that they do not become kinked or twisted, do not rub on edges and do not run without adequate protection through sharp-edged ducts.

Contact with hydraulic fluid!
Risk of adverse health effects, e.g., eye injury, skin irritation, poisoning from inhalation.
- Avoid contact with hydraulic fluids.
- When working with hydraulic fluids, strictly observe the safety instructions provided by the lubricant manufacturer.
- Wear your personal protective equipment (e.g., safety goggles, safety gloves, suitable working clothes, safety shoes).
- Consult a doctor immediately if hydraulic fluid gets in your eyes or bloodstream, or is swallowed.

⚠ CAUTION

Escaping hydraulic fluid due to machine/system leakage!
Risk of burns and risk of injury due to escaping oil jet.
- ▶ Depressurize the relevant machine/system part and repair the leak.
- ▶ Never attempt to block or seal the leak or oil jet with a cloth.

Danger from improper handling!
Risk of slipping. Risk of slipping on wet surfaces when using the control block as a climbing aid.
- ▶ Never use the control block for grabbing or climbing.
- ▶ Check how to safely get on top of the machine.

2.4 Personal protective equipment

The personal protective equipment is the responsibility of the user of the control block. Observe the safety regulations and provisions in your country.
All pieces of personal protective equipment must be intact.
Bosch Rexroth recommends that personal protective equipment for users of the product comprises:
- Heat-resistant protective clothing, e.g. safety gloves when working on the control block
- Safety shoes, safety gloves, safety goggles, hearing protection, and suitable working clothes for working on the control block

3 General instructions on damage to property and the product

The warranty only applies to the delivered configuration.
Entitlement to warranty claims is void due to
- incorrect assembly, commissioning and operation,
- improper use,
- removal of tamper-proof caps and seals (e.g. with pressure settings),
- adjustment of the factory settings provided on delivery,
- modifications and extensions,
- opening the valve,
- improper handling,
- Using spare parts that are not original spare parts from Rexroth.

Housing and parts

- Only original parts from Rexroth may be used.
- Replace elastic seal elements with new ones after removing.
- The housing and parts must be clean and undamaged.
- Damaged housings and parts may no longer be used.
- Reworking threads is not permissible.
- Reworking holes is not permissible.
- Prevent dirt from entering holes and threads.

Flange surfaces and sealing surfaces

- Adhesion forces may act between the flange surfaces during disassembly.
- Remove soiling with a sharpening stone and clean with an oil-soaked cleaning cloth.
- Surfaces with impressions or traces of wear in the sealing surface may no longer be used.
- Reworking the sealing surfaces is not permissible.

Vise

- Protective braces with hard rubber must be used. Sealing and flange surfaces must not be damaged.

Tools required

- Oil-soaked cleaning cloth
- Sharpening stone
- Mechanics' tool
- Torque wrench
- Rexroth repair case
  - Assembly-disassembly brushes
  - Special socket wrench
  - Tool

The following safety instructions apply for chapters 6 to 14.

NOTICE

Danger from improper handling!

Product can get damaged.

- Do not expose the product to excessive mechanical, hydraulic or electric load.
- Never grab or climb onto the product.
- Do not use sensitive attachments (e.g., actuation elements, sensors, solenoids, or valves) to transport the control block.
- Carefully place the control block onto the contact surface to prevent it from being damaged and secure it against falling.
- Do not place/lay any objects on the product.
- Do not set/place the control block onto the actuation elements.
- Do not strike sensitive attachments (e.g., actuation elements, sensors, solenoids, or valves).
- Do not strike sealing surfaces (e.g., working ports).
- Leave the protective covers on the control block until you connect the lines.
- Disconnect all electrical connectors before starting painting operations.
- Make certain that the electronic components (e.g., sensors) do not become electrostatically charged (e.g., during painting operations).

Risk of property damage due to improper lubrication!

Product can get damaged or destroyed.

- Always commission the control block with sufficient hydraulic fluid.
- When commissioning a machine, make sure that the housing area and the suction and working lines of the control block are filled with hydraulic fluid and keep them filled during operation.

Liquids and foreign particles enter due to missing seals and plugs!

Loss of protection class and danger of short circuit!

- Prior to installation, make sure that all seals and plug-in connections are tight.

Mixing of hydraulic fluids!

Product can get damaged.

- Before installation, remove all fluids from the control block to prevent mixing with the hydraulic fluid that is used in the machine.
- Any mixing of hydraulic fluids from different manufacturers or different types from the same manufacturer is generally not permitted.

NOTICE

Contamination of the hydraulic fluid!
The cleanliness of the hydraulic fluid has a considerable impact on the cleanliness and service life of the hydraulic system. Contamination of the hydraulic fluid can cause premature wear and malfunctions!

- Make sure that the working environment at the installation site is fully free of dust and foreign substances in order to prevent foreign particles, such as welding beads or metal cuttings, from getting into the hydraulic lines and causing product wear or malfunctions. The control block must be installed in a clean condition.
- Use only clean ports, hydraulic lines and attachments (e.g., measuring equipment).
- No contamination may enter the ports when they are sealed.
- Before commissioning, make sure that all hydraulic connections are tight and that all of the seals and plugs are installed correctly to ensure that they are leak proof and fluids and foreign particles are prevented from penetrating the product.
- Use a suitable filter system to filter hydraulic fluids during filling to minimize solid impurities and water in the hydraulic system.

Improper cleaning!
Product can get damaged.

- Plug all openings with appropriate protective equipment to prevent cleaning agents from entering the control block.
- Never use solvents or corrosive cleaning agents. Clean the control block using only water and a mild cleaning agent if necessary.
- Do not point the high-pressure cleaner at sensitive components, e.g. Rubber parts (the bellows), electrical connections (solenoids and sensors), and actuation elements.
- Use fibre-free cloths for cleaning.

Environmental pollution due to improper disposal!
Careless disposal of the control block, the hydraulic fluid and the packaging material can result in environmental pollution!

- Dispose of the control block, hydraulic fluid, and packaging in accordance with the national regulations in your country.
- Dispose of the hydraulic fluid in accordance with the applicable safety data sheet for the hydraulic fluid.

Danger from chemical or corrosive environmental conditions!
Product can get damaged. If the control block is exposed to chemical or corrosive environmental conditions, such as sea water, fertilizer or road salt, it can result in corrosion or, in extreme cases, malfunction. Hydraulic fluid can escape if leaks occur.

- Take appropriate steps to protect the control block from chemical or corrosive environmental conditions.

NOTICE

Escaping or spilling hydraulic fluid!

Risk of environmental pollution and contamination of ground water.

- When draining the hydraulic fluid, always place a drip tray under the control block.
- Use an oil binding agent if hydraulic fluid is spilled.
- Dispose of the hydraulic fluid according to the national regulations in your country.

Danger from hot components!

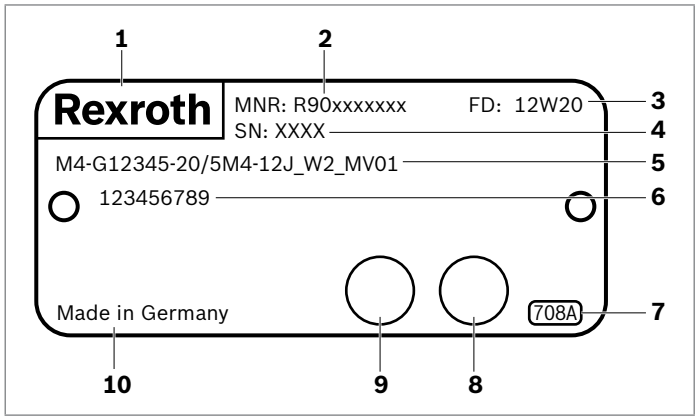
Nearby products can get damaged. Components which heat up (e.g., solenoids) can cause damage to nearby products if they are too close during installation.

- When installing the control block, check the distances to nearby products to ensure that they are not damaged.

4 Product description

4.1 Identification of the product

The control block and control block segments must be identified on the type plate.



1 Word mark (manufacturer)
2 Material number
3 Production date
4 Serial number
5 Material description
6 Customer material number
7 Area/plant number
8 Installation stamp
9 Inspection stamp
10 Designation of origin

4.2 Connection designation

Table 6: Connections

Designation	Port for
A	Consumer
B	Consumer
LS	LS signal
T	Tank or return
P	Pump
Y	Tank or pilot oil return
X	Pilot oil supply
M_A, M_B	Measuring port or external LS signal
❶, ❷, ❸	Tension rod bolt hole

4.3 Flange interface

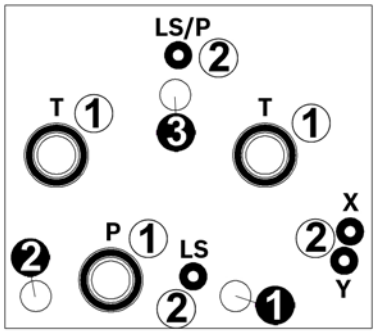


Fig. 1: Flange interface

4.4 Control block segments

The following control block segments are available:

Inlet plate (IP)
- IP for fixed displacement pump (FDP)
- IP for variable pump (VP)

Directional valves M4-12
- Multiple M4-12 directional valves can be arranged.

End plate (EP)
- The end plate closes off the control block.

4.4.1 Inlet plate

Table 7: Internal functions

Item	Designation
①	Primary pressure relief valve
②	Pilot oil supply cartridge
③	Pressure compensator

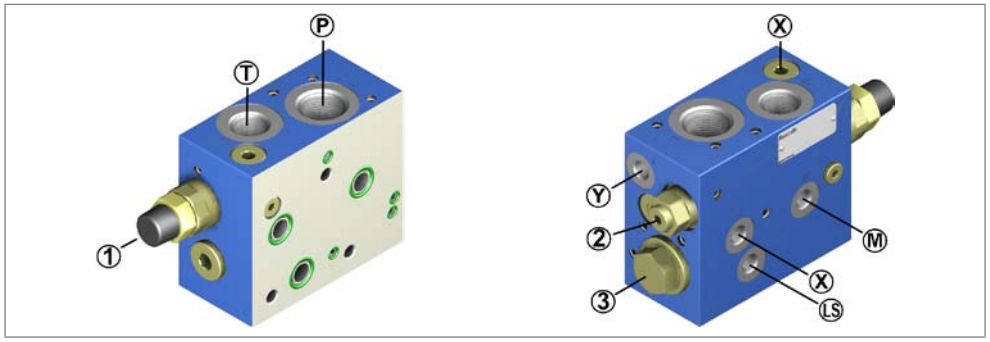


Fig. 2: Inlet plate for fixed displacement pump

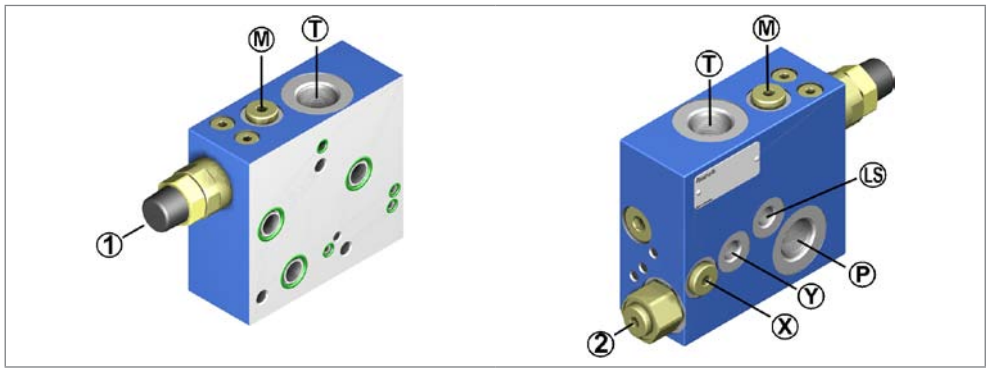


Fig. 3: Inlet plate for variable pump

4.4.2 Directional valves M4-12 – general

Table 8: External connections

Item	Designation	Information
Ⓐ	Valve side A	
Ⓑ	Valve side B	
Ⓐ	Service line port	
Ⓑ	Service line port	
①	Secondary pressure relief valve hole Ⓐ	optional
②	Secondary pressure relief valve hole Ⓑ	optional
③	LS pressure relief valve hole Ⓐ	optional
④	LS pressure relief valve hole Ⓑ	optional
⑤	LS port Ⓐ	optional
⑥	LS port Ⓑ	optional

Table 9: Internal functions

Item	Designation
⑦	Shuttle valve
⑧	Pressure compensator
⑨	Y LS port
⑩	X pilot oil port
⑪	X pilot oil supply Ⓑ

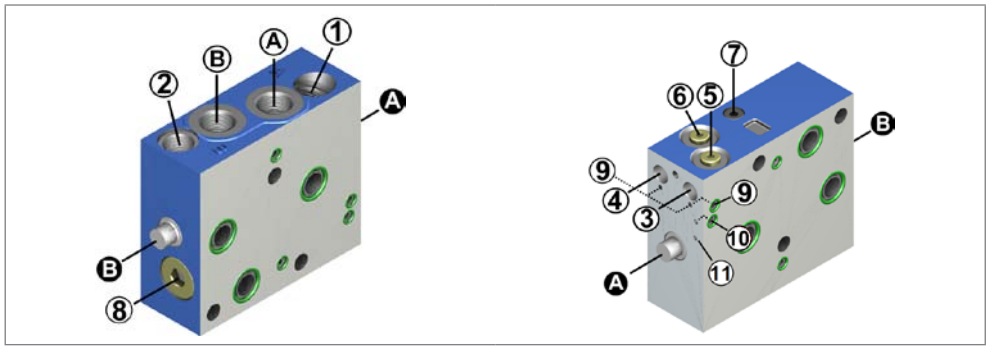


Fig. 4: Directional valve

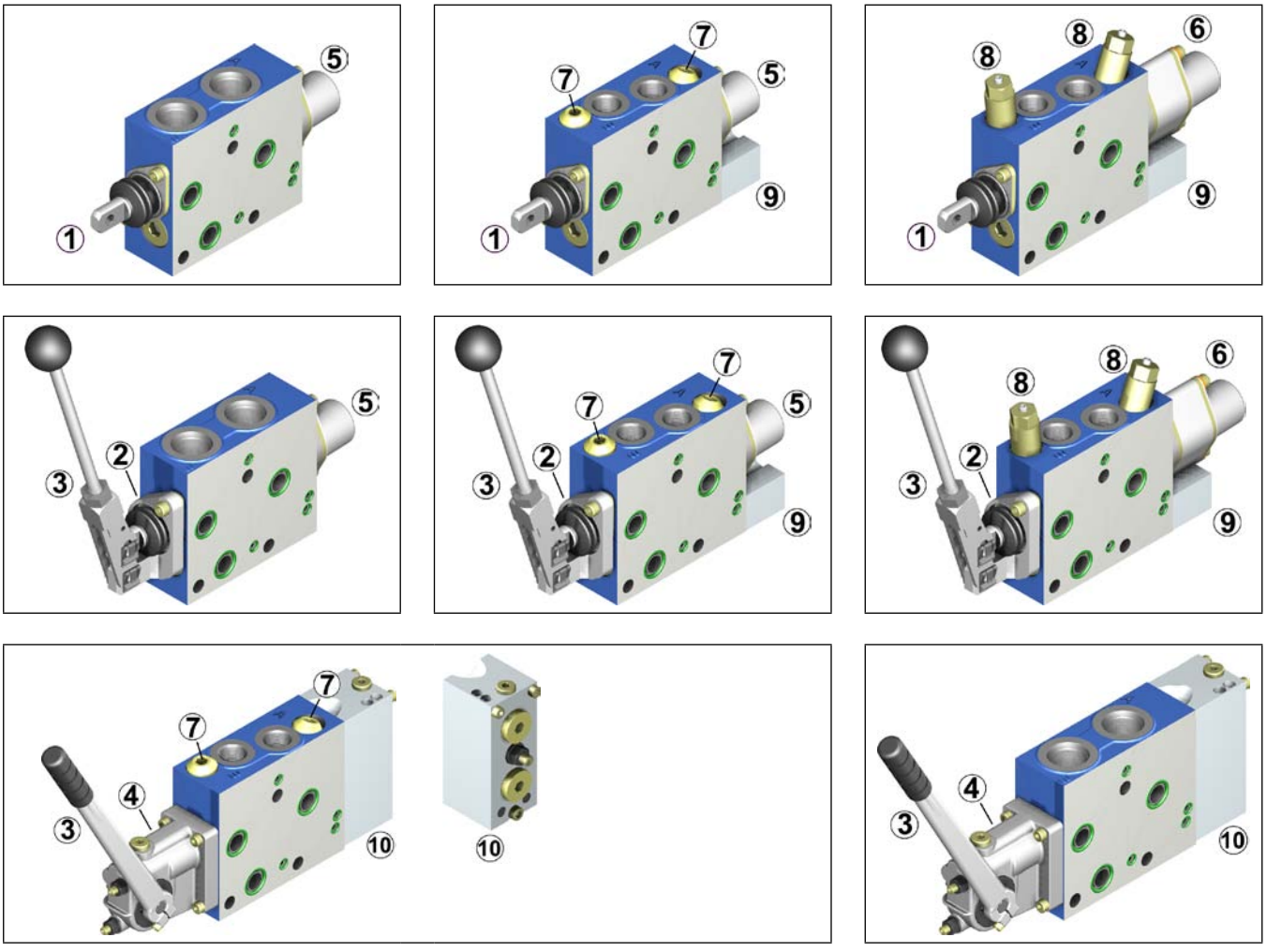
4.4.3 Directional valves M4-12 with purely mechanical actuation

Table 10: External connections

Item	Designation
①	Guide on the pilot spool
②	Bearing block
③	Hand lever
④	Cover, side B, with adjustable stroke limitation and setting shaft

Table 11: Internal functions

Item	Designation
⑤	Cover, side A
⑥	Cover, side A, with locking unit
⑦	Secondary pressure relief valve, not adjustable, or plug
⑧	Secondary pressure relief valve, adjustable
⑨	Cover for LS components
⑩	Cover, side A, with spring centering and stroke limitation



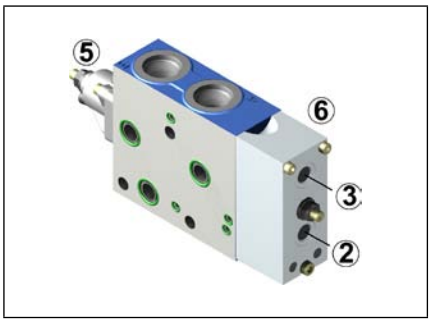
4.4.4 Directional valves M4-12 with hydraulic actuation

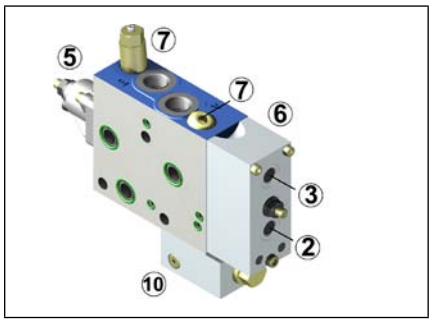
Table 12: External connections

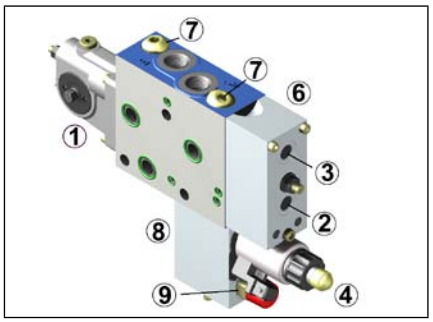
Item	Designation
①	Cover, side B, with adjustable stroke limitation and setting shaft/hand lever
②	Hydraulic actuation port **A**
③	Hydraulic actuation port **B**
④	Proportional pressure relief valve type KBPS

Table 13: Internal functions

Item	Designation
⑤	Cover, side B, with adjustable stroke limitation
⑥	Cover, side A, with adjustable stroke limitation
⑦	Secondary pressure relief valve or plug
⑧	Plate for electro-proportional pressure relief
⑨	Unloading valve
⑩	Plate for switchable directional valves







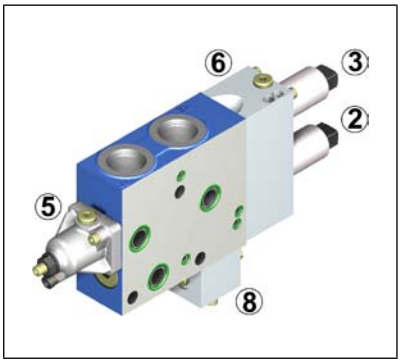
4.4.5 Directional valves M4-12 with electrohydraulic actuation

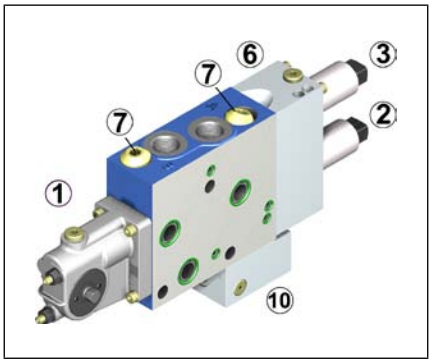
Table 14: External connections

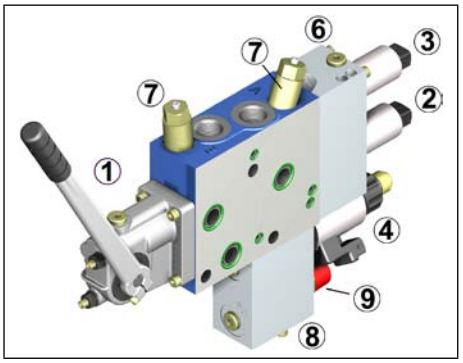
Item	Designation
①	Cover, side B, with adjustable stroke limitation and setting shaft/hand lever
②	Electrohydraulic actuation port A
③	Electrohydraulic actuation port B
④	Proportional pressure relief valve type KBPS

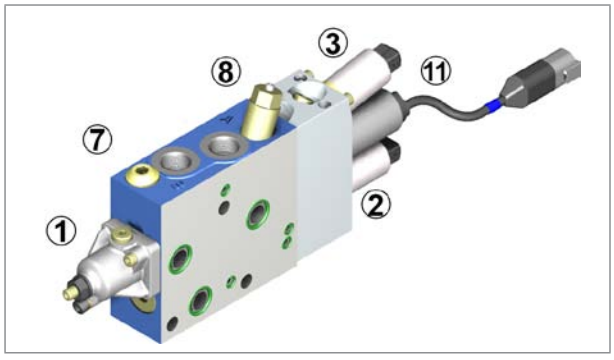
Table 15: Internal functions

Item	Designation
⑤	Cover, side B, with adjustable stroke limitation
⑥	Cover, side A, with adjustable stroke limitation
⑦	Secondary pressure relief valve or plug
⑧	Plate for electro-proportional pressure relief
⑨	Unloading valve
⑩	Plate for switchable directional valves
⑪	Spool position sensor









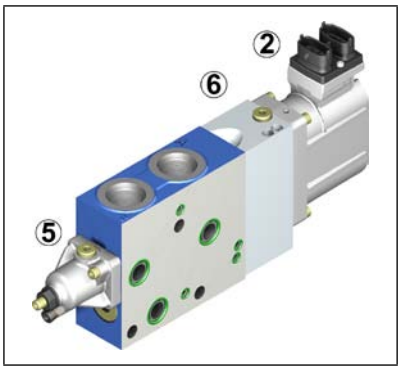
4.4.6 Directional valves M4-12 with on-board electronics

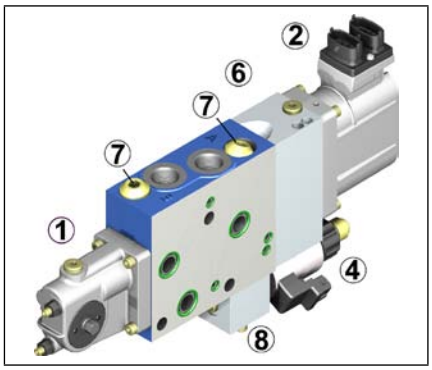
Table 16: External connections

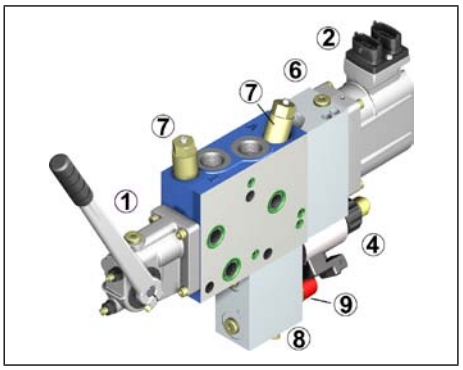
Item	Designation
①	Cover, side B, with adjustable stroke limitation and setting shaft/hand lever
②	EPM2 or CPM
④	Proportional pressure relief valve type KBPS

Table 17: Internal functions

Item	Designation
⑤	Cover, side B, with adjustable stroke limitation
⑥	Cover, side A, for EPM2 or CPM
⑦	Secondary pressure relief valve or plug
⑧	Plate for electro-proportional pressure relief
⑨	Unloading valve







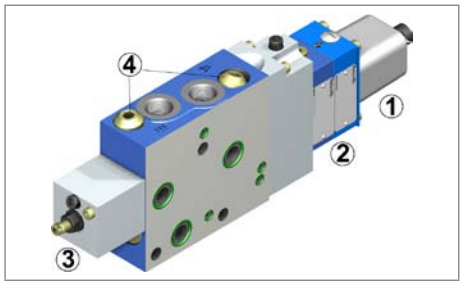
4.4.7 Directional valves M4-12 with servohydraulic actuation

Table 18: External connections

Item	Designation
①	Cover, side A, with servo adjusting unit

Table 19: Internal functions

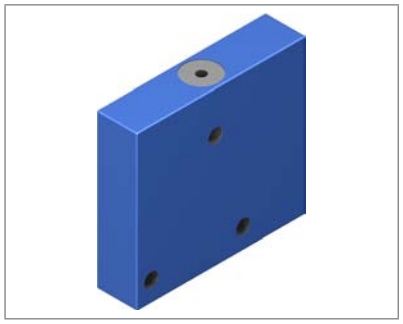
Item	Designation
②	Cover, side A, for servo adjusting unit
③	Cover, side B, with adjustable stroke limitation
④	Secondary pressure relief valve, not adjustable, or plug

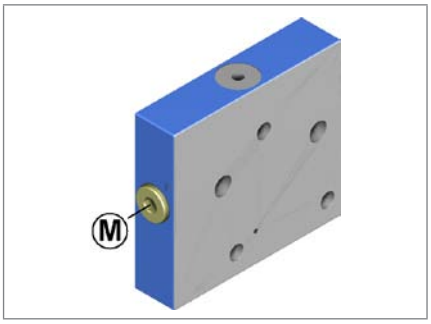


4.4.8 End plate

Table 20: External connections

Item	Designation
M	Measuring port





4.5 Control block versions

Fig. 5: Purely mechanical actuation with guide

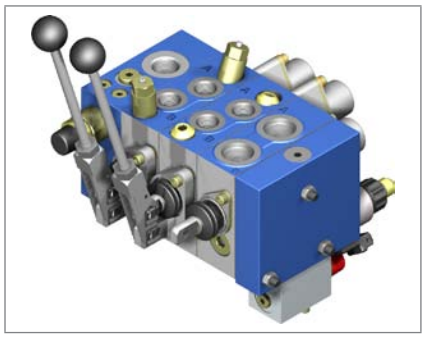


Fig. 6: Purely mechanical actuation with guide/hand lever

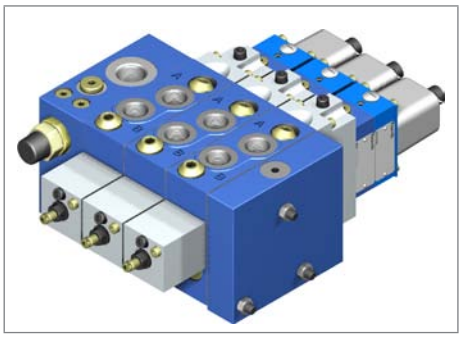


Fig. 7: Servohydraulic actuation

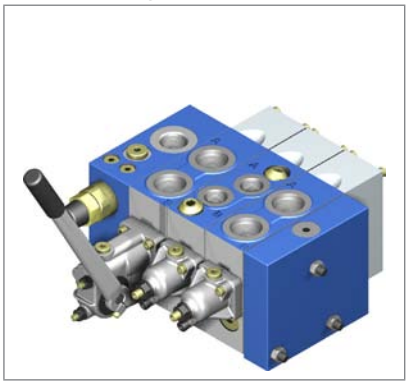


Fig. 8: Hydraulic actuation

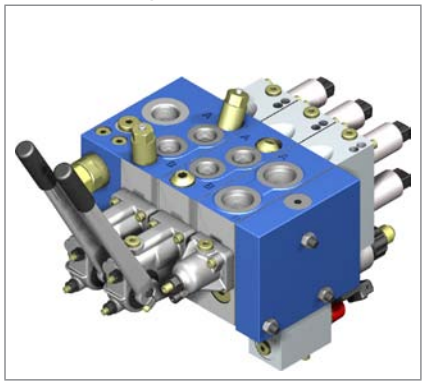


Fig. 9: Electrohydraulic actuation

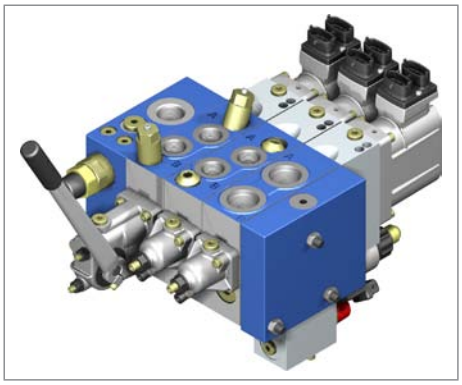


Fig. 10: Electrohydraulic actuation with on-board electronics

Control blocks in the M4-12 series have a modular structure. They can be combined to provide the perfect solution for the application at hand.
The pictures shown are example configurations.

5 General instructions for assembly

This section contains generally valid instructions for assembly, disassembly and repair of the control block M4-12.
Detailed instructions for assembly, disassembly and repair can be found in the following documents:

Table 21: Related documents

	Document number
Assembly of the control block segments	64276-10-R
Repairing the valve	64276-20-R
Repairing the electro-proportional pressure relief	64276-30-R
Repairing the electronics EPM2	64276-40-R
Repairing the electronics CPM	64276-41-R
Repairing the inlet plate	64276-50-R
Repairing the inlet plate for safety-related applications	64276-51-R

5.1 Screw connection for hydraulic connections

- Pipe thread in accordance with ISO 2281
- Lightly grease the screw connection

5.2 Screw connection on the control block segment

Tools
- Torque wrench

Assembly
1. Use the screw connection in accordance with section 5.1 “Screw connection for hydraulic connections” on page 20.
2. Screw the screw connection in clockwise.
3. Tighten the screw connection with a torque wrench in accordance with the manufacturer’s instructions.

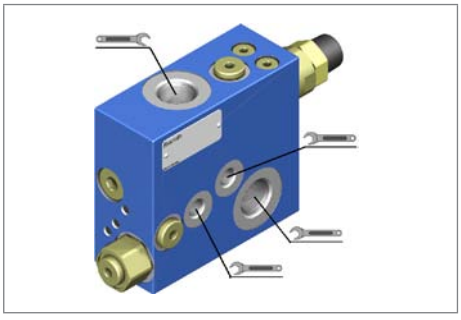


Fig. 11: Inlet plate

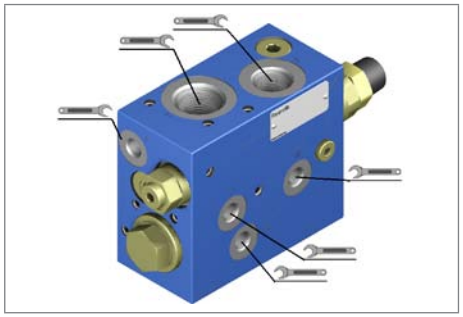


Fig. 12: Inlet plate

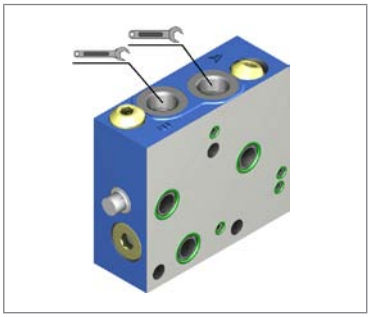


Fig. 13: Directional valve

5.3 Fixing the control block in place

Preparation

- The fixing threads are located on the underside of the inlet and end plate.
- Cylindrical metric screws (M) with strength class 8.8 or 10.9 should be used.
  – Maximum surface roughness RZ max. 63.
- Flatness of the surface 0.1 mm.

Assembly

1. Align the control block with the fixing threads facing the fixing through-holes.
2. Screw the screws into the fixing threads clockwise and by hand.
3. Pre-tension the screws with a torque of 5^{+1} Nm.
4. Tighten the fixing screws clockwise using a torque wrench in accordance with Table 22.

Table 22: Tightening torques

Screw	Tightening torque	Minimum screw-in depth of the thread	Through-hole diameter
M10 (8.8)	$41^{\pm 2}$ Nm	15 mm	$11^{+0.2}$ mm
M10 (10.9)	$60^{\pm 3}$ Nm	15 mm	$11^{+0.2}$ mm

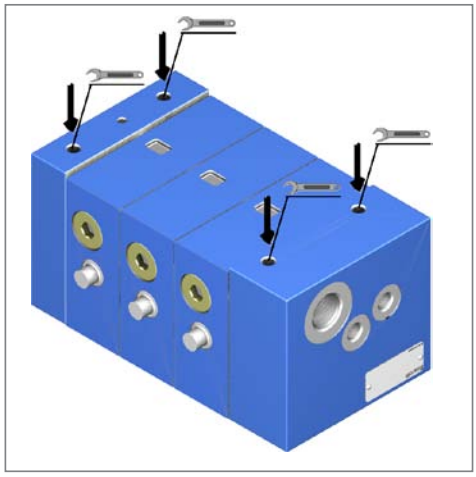


Fig. 14: Fixing the control block in place

6 Testing and re-commissioning

Before retrofitting or modifying a directional valve or a control block, tests must be performed to ensure that the modification will not impede the function of the application or cause it to work incorrectly.
Follow the instructions in the corresponding instruction manual.
See Table 1 “Required and supplementary documentation”, on page 4.

- In the event of malfunctions, see the section 7 “Fault finding” on page 28.

7 Fault finding

Table 23: Fault finding

Fault number Fault	**Cause or location of fault**	**Remedy**
F1 Oil is escaping from the control block segment	Seal element damaged	Replace the seal element
	Control block segment housing damaged	Replace the control block segment with a new one
F2 Oil is escaping from the supply line or the connection to the control block segment	Seal element damaged	Replace the seal element
	Pipelines or hoses damaged	Replace the pipelines or hoses
	Pipelines or hoses loose	Tighten the screw connections
	Control block segment housing damaged	Replace the control block segment with a new one
F3 Oil is escaping between the control block segments	Dirt or foreign particles	Clean the flange surface
	Seal element damaged	Replace the seal element
	Tension rod bolts loose	Check the tightening torque
	Flange surface damaged	Replace the control block segment with a new one
F4 Fluctuations in pressure and oil flow	Pressure fluctuations in the system	Vent the control block segments
		Vent the hydraulic system
	Dirt or foreign particles in the control block segment	Clean the insides of the control block segments
		Check that the oil meets the specified oil cleanliness
F5 Temperature on the control block segment too high	Ambient temperature too high	System-related/remedial action with external measures
	Oil temperature too high	Reduce oil temperature
	Volume flow too high	Reduce volume flow
F10 Unit not functioning	Control block segment connected incorrectly	Correct the hydraulic ports
	Electrical components connected incorrectly	Correct the electrical connections
	Directional valve faulty	See repair manual 64276-20-R
	No oil	Ensure that the oil supply is connected and working correctly
	Dirt or foreign particles in the control block segment	Clean the insides of the control block segments
		Check that the oil meets the specified oil cleanliness

8 Accessories and spare parts

8.1 Accessories and spare parts on the Internet

Available accessories and spare parts can be found on the Internet at
www.boschrexroth.com/spc

8.2 Contact partners for accessories and spare parts

Accessories and spare parts are available:
- From the vehicle manufacturer (specialist dealer)
- From your Bosch Rexroth specialist dealer

Rexroth sales partners can be found on the Internet at
www.boschrexroth.com/addresses

For questions relating to repair and spare parts, contact your responsible Bosch Rexroth Service team.

Bosch Rexroth AG
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany
Tel. +49 (0) 9352 – 40 50 60
service@boschrexroth.de

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The Drive & Control Company

Rexroth
Bosch Group

Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
Germany
Tel. +49 9352 18-0
info.ma@boschrexroth.de
www.boschrexroth.com

Your local contact can be found at:
www.boschrexroth.com/addresses

Subject to change
Printed in Germany
RE 64276-01-R/10.2017